7.4.x. Exercise questions

1. Analyze the following in as much detail as possible:

a. *Every picture pleased everyone*.

b. *No picture pleased everyone*.

c. *No picture pleased anyone*.

d. *Each provision of the law affected every sector of the economy*.

e. *No picture pleased anyone except photographers*.

f. *Anyone who likes all mammals likes all horses*.

g. *The law stimulated only sectors of the economy that were affected by all its provisions*.

h. *No one who doesn't like all mammals likes any badger*.

i. *Everyone saw everything that anyone saw*.

j. *No one saw anything that anyone liked*.

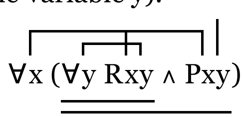
k. *No one who anyone could recall spoke to everyone*.

l. *No one who everyone could recall spoke to anyone*.

m. *Of the pictures anyone saw, no candid ones pleased everyone in them*.

n. *No law will affect only sectors of the economy that figure in all its provisions*.

2. In the logical forms below, indicate the scope of connectives and quantifiers and the patterns of binding of variables as in the example below (where a vertical line is used to mark a free occurrence of the variable y).



a. $\forall x\ Fx \rightarrow \forall y\ Gy$

b. $\forall x\ (Fx \rightarrow \forall y\ Gy)$

c. $\forall y\ (\forall x\ Fx \rightarrow Gy)$

d. $\forall y\ \forall x\ Fx \rightarrow Gy$

e. $(\forall x{:}\ \forall y\ Rxy)\ Fx$

f. $\forall y\ (\forall x{:}\ Rxy)\ Fx$

g. (∀x: Rxy) ∀y Fx

h. (∀x: ∀y Rxy) Pxy

3. Synthesize idiomatic English sentences that express the propositions associated with the following logical forms using the intensional interpretation below. The way quantifiers are most naturally stated in English can depend on what other quantifiers in the sentence, so you may need to back up and revise the way you put one quantifier into English in order to state another.

[B: λxy (x *has bitten* y); D: λxy (x *despises* y); M: λx (x *is a mosquito*); P: λx (x *is a person*); S: λxy (x *is smaller than* y)]

a. (∀x: Mx) (∀y: Py) Dxy

b. (∀x: Px) ¬ (∀y: My) Dxy

c. (∀x: Mx) (∀y: Py) ¬ Dyx

d. (∀x: Px) (∀y: My ∧ Byx) ¬ Dxy

e. (∀x: Px ∧ (∀y: My) Dxy) (∀z: Mz) ¬ Bzx

f. ∀x (∀y: Sxy) ¬ Syx